

BEST PRACTICES RESOURCES — DELIVERABLE #1

June 2010

01. Access Management

- Access Management Manual, Mn/DOT (www.dot.state.mn.us/accessmanagement/accessmanagementmanual.html)
- Mn/DOT's County Road Safety Plans, Phase II Analysis, 2011.
- Technical Guidelines for the Control of Direct Access to Arterial Highways, Volume II: Detailed Description of Access Control Techniques, Report No. FHWA-RD-76-87, Glennon, J. C., et al., Federal Highway Administration, 1975. (www.fhwa.dot.gov/publications/research/safety/99207/08.cfm)
- NCHRP 420 – Impacts of Access Management Techniques, Gluck, J, et al, 1999. (www.fhwa.dot.gov/publications/research/safety/99207/08.cfm)
- Statistical Relationship between Vehicular Crashes and Access, LRRB Report 1998-27, Preston, H., 1998. (www.fhwa.dot.gov/publications/research/safety/99207/08.cfm)
- A Guidebook for Including Access Management in Transportation Planning, NCHRP 548. (http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_548.pdf)
- Access Management Awareness Program Phase II Summary Report, Iowa DOT, Center for Transportation Research and Education, Iowa State University, Maze, T and Plazak, D, 1997. (www.ctre.iastate.edu/research/access/)
- Iowa's Statewide Urban Design Standards Promote Improved Access Management Iowa DOT, Center for Transportation Research and Education, Iowa State University, Plazak, D and Harrington, D, 2003. (www.ctre.iastate.edu/pubs/midcon2003/PlazakStandards.pdf)

02. Rural Intersection Lighting

- Safety Impacts of Street Lighting at Isolated Rural Intersections – Part II, LRRB 2006-35 (www.lrrb.org/pdf/200635ts.pdf or www.lrrb.org/pdf/200635.pdf)
- Safety Impacts of Street Lighting at Isolated Rural Intersections, LRRB 1999-17 (www.lrrb.org/pdf/199917.pdf)
- Strategies to Address Nighttime Crashes at Rural, Unsignalized Intersections, Iowa Highway Research Board (TR-540), 2008. (www.intrans.iastate.edu/reports/nighttime-lighting.pdf)
- Statistical Models of At-Grade Intersection Accidents, FHWA-RD-96-125, March 2000. (www.fhwa.dot.gov/publications/research/safety/99094/99094.pdf)
- Reducing Late-Night/Early Morning Intersection Crashes by Providing Lighting, FHWA-SA-09-017, 2009. (<http://safety.fhwa.dot.gov/intersection/resources/casestudies/fhwasa09017/>)

03. Mailboxes

- Mn/DOT's Standard Plate 9350A (www.dotapp7.dot.state.mn.us/edms/download?docId=849021)
- Crash Tests of Minnesota Mailbox Supports, LRRB 1981-08, Althea, A. and Ross, R., July 1981. (Not available online: www.lrrb.org/detail.aspx?productid=343)
- Urban Mailbox Installation Guidelines, LRRB MN/RC 2010MAIL, July 2010. (www.lrrb.org/pdf/2010mail.pdf)
- Is Your Mailbox a Hazard?, LRRB Brochure (www.lrrb.org/pdf/2010mailb.pdf)

04. Edgeline Rumble

- Evaluation of Rumble Stripes on Low-Volume Rural Roads in Iowa – Phase I, Institute for Transportation, Iowa State University, Hallmark, S. et. al., 2009. (www.intrans.iastate.edu/reports/HallmarkTR-577_report.pdf)
- Guidance for the Design and Application of Shoulder & Centerline Rumble Strips, NCHRP Report 641, 2009. (http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_641.pdf)
- Synthesis on the Effectiveness of Rumble Strips (www.lrrb.org/pdf/200207.pdf)
- Identification of Causal Factors and Potential Countermeasures for Fatal Rural Crashes (www.lrrb.org/pdf/200542.pdf)

05. Traffic Signs

- Minnesota Manual on Uniform Traffic Control Devices (www.dot.state.mn.us/trafficeng/publ/mutcd/index.html)
- Speed Limit vs. Actual Speed, Mn/DOT Unpublished Data
- Minnesota's Best Practices for Traffic Sign Maintenance/Management Handbook, 2010. (www.lrrb.org/pdf/2010RIC10.pdf)
- Effectiveness of Traffic Signs on Local Roads (www.lrrb.org/pdf/trs1002.pdf)
- Putting Research into Practice: Establishing a Sign Retroreflectivity Maintenance Program (www.lrrb.org/pdf/2010ric02ts.pdf)
- Effectiveness of "Children at Play" Warning Signs, WisDOT (<http://on.dot.wi.gov/wisdotresearch/database/tsrs/tsrchildrenwarningsigns.pdf>)

06. Pavement Markings

- Minnesota Manual on Uniform Traffic Control Devices (www.dot.state.mn.us/trafficeng/publ/mutcd/index.html)
- Mn/DOT Policy for Pavement Marking Operations (<http://dotapp7.dot.state.mn.us/edms/download?docId=700101>)
- Safety Evaluation of STOP AHEAD Pavement Markings, FHWA-HRT-08-043, Gross, F and et. Al., December 2007. (www.fhwa.dot.gov/publications/research/safety/08043)
- State of Practice for Minnesota Local Agency Pavement Marking Management (www.lrrb.org/PDF/201005TS.pdf)
- Minnesota Local Agency Pavement Marking Practices - Phase I (www.lrrb.org/pdf/201005.pdf (2MB))
- Developing and Implementing Enhanced Pavement Marking Management Tools: Phase I—Mapping Tool (www.lrrb.org/pdf/200837ts.pdf)
- 2008-37 Developing and Implementing Enhanced Pavement Marking Management Tools for the Minnesota Department of Transportation (www.lrrb.org/pdf/200837.pdf)
- Cost of Pavement Marking Materials (www.lrrb.org/PDF/200011.pdf)

07. Intersection Treatments

- How About a Roundabout? The Minnesota Experience – DVD (www.dot.state.mn.us/research/videos.html)
- How About a Roundabout? A Minnesota Guide – Brochure (www.lrrb.org/pdf/FinalRoundaboutBrochure.pdf)
- What is a J-Turn ? Missouri DOT video (www.youtube.com/watch?v=Kfu6yx9kgCY)
- Unconventional Arterial Intersection Design Interactive Website, University of Maryland Applied Technology and Traffic Analysis Program (http://attap.umd.edu/uaid_agus.php?UAIDType=25&Submit=Submit&iFeature=1)

08. Transverse Rumbles

- 1970d/80d Iowa Highway and Research Board HR-235, Carstens & Woo, A982.
- Mn/DOT's Transportation Synthesis Report, TRS 0701, August 2007. (<http://lrrb.org/TRS0701.pdf>)
- Stopping Behavior at Real-World Stop-Controlled Intersections with and Without In-Lane Rumble Strips, LRRB 2006-42, Harder, K., 2006. (www.cts.umn.edu/Publications/ResearchReports/reportdetail.html?id=1134)
- Identification of Causal Factors and Potential Countermeasures for Fatal Rural Crashes (www.lrrb.org/pdf/200542.pdf)
- The Effects of In-Lane Rumble Strips on the Stopping Behavior of Sleep-Deprived Drivers (www.lrrb.org/pdf/200516.pdf)
- The Effects of In-Lane Rumble Strips on the Stopping Behavior of Attentive Drivers (www.lrrb.org/PDF/200211.pdf)
- The Effect of Rumble Strips on Drivers Approaching Rural, Stop-Controlled Intersections (www.lrrb.org/pdf/200642TS.pdf)

09. Safety Edge

- Safety Evaluation of the Safety Edge Treatment, FHWA-HRT-11-024, March 2011 (www.fhwa.dot.gov/publications/research/safety/11024/index.cfm)
- Safety Evaluation of the Safety Edge Treatment, Year 1 Interim Report. University of North Carolina, MRI Project No. 110495.1.001, April 2008. (www.pooledfund.org/documents/TPF-5_097/110495-01R_Interim_Report.pdf)
- The Safety Edge, FHWA Publication Number FHWA-SA-09-023. (http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/)
- The Safety Edge Brochure, FHWA Publication Number FHWA-SA-10-034. (http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/brochure/brochure.pdf)
- Effects of Pavement Shoulder Drop-Offs on Highway Safety, TRB State of the Art Report 6, John Glennon, 1986. (<http://pubsindex.trb.org/view.aspx?id=302638>)

10. Horizontal Curves

- In-Vehicle Technologies and Infrastructure Modifications to Prevent Crashes Along Curves and Shoulders (www.lrrb.org/pdf/200939TS.pdf)
- Benefit:Cost Analysis of In-Vehicle Technologies and Infrastructure Modifications as a Means to Prevent Crashes Along Curves and Shoulders (www.lrrb.org/pdf/200939.pdf)
- Simplifying Delineator and Chevron Applications for Horizontal Curves, FHWA/TX-04/0-4052-1 (<http://tti.tamu.edu/documents/0-4052-1.pdf>)
- Horizontal Curve Signing Handbook, FHWA/TX-07/0-5439-P1 (<http://tti.tamu.edu/documents/0-5439-P1.pdf>)

11. Confirmation Lights

- www.stopredlightrunning.com
- *Red-Signal Enforcement Lights*, FHWA-SA-09-005, May 2009. (<http://safety.fhwa.dot.gov/intersection/resources/techsum/fhwasa09005/fhwasa09005.pdf>)
- *Evaluation of Innovative Safety Strategies*, Florida DOT, January 2008. (www.dot.state.fl.us/research-center/Completed_Proj/Summary_SF/BD500/BD500_rpt.pdf)

12. Guardrail and End Treatments

- AASHTO Roadside Design Guide
- Minnesota State Aid Manual
- *Pooling Our Research: Innovative Technologies to Improve Motorist Safety During Roadside Crashes* ([www.lrrb.org/PDF/2010TPF-5\(193\)TS.pdf](http://www.lrrb.org/PDF/2010TPF-5(193)TS.pdf))
- *Identification of Causal Factors and Potential Countermeasures for Fatal Rural Crashes* (www.lrrb.org/pdf/200542.pdf)
- *The Safety and Cost-Effectiveness of Bridge-Approach Guardrail For County State-Aid (CSAH) Bridges in Minnesota* (www.lrrb.org/pdf/200539.pdf)

13. Clear Zones

- AASHTO Roadside Design Guide
- *Mn/DOT District 1, Traffic Engineering TH 6/TH 38 Before and After Study*
- *Toward Zero Deaths - Maintaining a Safer Roadway Workshop* (www.lrrb.org/PDF/2010RIC03.pdf)

14. Pedestrians

- *Safety Effectiveness of Leading Pedestrian Intervals Evaluated by a Before-After Study*, Transportation Research Board of the National Academies, ISSN 0361-1981, Volume 2198, 2010. (Not Available online)
- *Association Between Roadway Intersection Characteristics and Pedestrian Crash Risk in Alameda County, California*, Transportation Research Board of the National Academies, ISSN 0361-1981, Volume 2198, 2010. (Not available online)
- *Bicycle and Pedestrian Toolbox* (www.lrrb.org/pdf/200602.pdf)
- *How To More Safely Accommodate Pedestrians Through An Intersection With Free Flow Legs* (www.lrrb.org/pdf/200424.pdf)
- *Evaluating Active and Passive Crosswalk Warnings at Unsignalized Intersections and Mid-Block Sites* (www.lrrb.org/pdf/200903TS.pdf)
- *Warning Efficacy of Active Versus Passive Warnings for Unsignalized Intersection and Mid-Block Pedestrian Crosswalks* (www.lrrb.org/pdf/200903.pdf)

15. Turn Lanes

- Mn/DOT Access Management Manual
- Mn/DOT Road Design Manual
- *Bypass Lane Safety, Operations and Design Study*, LRRB Research 2000-22, Preston, H, 2000. (www.lrrb.org/PDF/200022.pdf)
- *Design of Turn Lane Guidelines* (www.lrrb.org/pdf/201025.pdf)
- *Traffic Volume Thresholds for Requiring Right Turn Lanes and Treatments on Two-Lane Roads* (www.lrrb.org/pdf/200825ts.pdf)
- *Turn Lane Lengths for Various Speed Roads and Evaluation of Determining Criteria* (www.lrrb.org/pdf/200814.pdf)
- *Warrants for Right-Turn Lanes/Treatments on Two-Lane Roads* (www.lrrb.org/pdf/200825.pdf)